STN Search History

FILE 'HOME' ENTERED AT 13:45:10 ON 23 JUN 2003

L1 QUE (PLASMODIUM OR FALCIPARUM OR MALARIA) AND (VAR (S) (PROTEIN OR GENE) O
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(FILE 'HOME' ENTERED AT 13:45:10 ON 23 JUN 2003)

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, AQUASCI, BIOBUSINESS, BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CANCERLIT, CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DRUGB, DRUGLAUNCH, DRUGMONOG2, ...' ENTERED AT 13:45:32 ON 23 JUN 2003

SEA (PLASMODIUM OR FALCIPARUM OR MALARIA) AND (VAR (S) (PROTEIN

1	FILE ADISCTI
8	FILE AGRICOLA
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7	FILE BIOBUSINESS
5	FILE BIOCOMMERCE
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38	FILE BIOTECHDS
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234	FILE USPATFULL

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              1   FILE VETB
             26   FILE WPIDS
             26   FILE WPINDEX
L1             QUE (PLASMODIUM OR FALCIPARUM OR MALARIA) AND (VAR (S) (PROTEIN
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     FILE 'MEDLINE, CAPLUS, BIOSIS, BIOTECHNO, LIFESCI, EMBASE, SCISEARCH'
     ENTERED AT 13:50:05 ON 23 JUN 2003
L2          3240 S L1
L3           349 S L2 AND (MATERNAL OR PLACENTA# OR CHONDROITIN OR CSA)
L4            98 DUP REM L3 (251 DUPLICATES REMOVED)
L5            93 S L4 AND (CSA OR CHONDROITIN)
L6            42 S L5 AND (MATERNAL OR PLACENT##)
L7            51 S L5 NOT L6
L8            26 S L7 NOT PY>1999
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L6 ANSWER 17 OF 42 MEDLINE
TI **Plasmodium falciparum** domain mediating adhesion to **chondroitin** sulfate A: a receptor for human **placental** infection.
AU Buffet P A; Gamain B; Scheidig C; Baruch D; Smith J D; Hernandez-Rivas R; Pouvelle B; Oishi S; Fujii N; Fusai T; Parzy D; Miller L H; Gysin J; Scherf A
SO PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1999 Oct 26) 96 (22) 12743-8.
Journal code: 7505876. ISSN: 0027-8424.

L6 ANSWER 18 OF 42 MEDLINE
TI The adhesion of **Plasmodium falciparum**-infected erythrocytes to **chondroitin** sulfate A is mediated by P. **falciparum** erythrocyte membrane protein 1.
AU Reeder J C; Cowman A F; Davern K M; Beeson J G; Thompson J K; Rogerson S J; Brown G V
SO PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1999 Apr 27) 96 (9) 5198-202.
Journal code: 7505876. ISSN: 0027-8424.

L6 ANSWER 19 OF 42 MEDLINE
TI [**Plasmodium falciparum** and **chondroitin** -4-sulfate: the new key couple in sequestration]. **Plasmodium falciparum** et chondroitine-4-sulfate: le nouveau couple cle de la sequestration.
AU Pouvelle B; Fusai T; Gysin J
SO MEDECINE TROPICALE, (1998) 58 (2) 187-98. Ref: 125
Journal code: 8710146. ISSN: 0025-682X.

L6 ANSWER 20 OF 42 MEDLINE
TI Inhibition of **binding** of **malaria**-infected **erythrocytes** by a tetradecasaccharide fraction from **chondroitin** sulfate A.
AU Beeson J G; Chai W; Rogerson S J; Lawson A M; Brown G V
SO INFECTION AND IMMUNITY, (1998 Jul) 66 (7) 3397-402.
Journal code: 0246127. ISSN: 0019-9567.

L6 ANSWER 21 OF 42 MEDLINE
TI **Plasmodium falciparum**-infected erythrocytes adhere to the proteoglycan thrombomodulin in static and flow-based systems.
AU Rogerson S J; Novakovic S; Cooke B M; Brown G V
SO EXPERIMENTAL PARASITOLOGY, (1997 May) 86 (1) 8-18.
Journal code: 0370713. ISSN: 0014-4894.

L6 ANSWER 23 OF 42 CAPLUS COPYRIGHT 2003 ACS
TI Variants of **Plasmodium falciparum** erythrocyte membrane protein 1 expressed by different **placental** parasites are closely related and adhere to **chondroitin** sulfate A
AU Khattab, Ayman; Kun, Jurgen; Deloron, Philippe; Kremsner, Peter G.; Klinkert, Mo-Quen
SO Journal of Infectious Diseases (2001), 183(7), 1165-1169
CODEN: JIDIAQ; ISSN: 0022-1899

L6 ANSWER 24 OF 42 CAPLUS COPYRIGHT 2003 ACS
TI **Plasmodium falciparum** gene FCR3.varCSA EMP1 (**erythrocyte** membrane protein 1) protein, its sequence, functional domains, recombinant production, **binding** to **chondroitin** sulfate A, therapeutic and diagnostic uses

IN Scherf, Arthur; Miller, Louis H.; Gamain, Benoit; Baruch, Dror I.; Buffet, Pierre; Scheidig, Christine; Gysin, Jurg; Pouvelle, Bruno; Fujii, Nbbutaka; Smith, Joseph
SO PCT Int. Appl., 78 pp.
CODEN: PIXXD2

L6 ANSWER 26 OF 42 CAPLUS COPYRIGHT 2003 ACS
TI **Chondroitin** sulfate A as an adherence receptor for **Plasmodium falciparum**-infected erythrocytes
AU Rogerson, S.J.; Brown, G.V.
SO Parasitology Today (1997), 13(2), 70-75
CODEN: PATOE2; ISSN: 0169-4758

L6 ANSWER 33 OF 42 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI **Plasmodium falciparum** isolates from infected pregnant women and children are associated with distinct adhesive and antigenic properties.
AU Beeson, James G. (1); Brown, Graham V.; Molyneux, Malcolm E.; Mhango, Chisale; Dzinjalamala, Fraction; Rogerson, Stephen J.
SO Journal of Infectious Diseases, (Aug., 1999) Vol. 180, No. 2, pp. 464-472.
ISSN: 0022-1899.

L6 ANSWER 34 OF 42 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI **Plasmodium falciparum**-infected erythrocytes: A mutational analysis of cytoadherence via murine thrombomodulin.
AU Rabhi-Sabile, Samia; Steiner-Mosonyi, Marta; Pollefeyt, Saskia; Collen, Desire; Pouvelle, B.; Gysin, Jurg; Boffa, Marie-Claire; Conway, Edward M. (1)
SO Thrombosis and Haemostasis, (May, 1999) Vol. 81, No. 5, pp. 815-821.
ISSN: 0340-6245.

L6 ANSWER 35 OF 42 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI Cytoadherence of **Plasmodium falciparum** to intercellular adhesion molecule 1 and **chondroitin**-4-sulfate expressed by the syncytiotrophoblast in the human **placenta**.
AU Maubert, Ebertrand; Guilbert, Larry J.; Deloron, Philippe (1)
SO Infection and Immunity, (1997) Vol. 65, No. 4, pp. 1251-1257.
ISSN: 0019-9567.

L6 ANSWER 36 OF 42 LIFESCI COPYRIGHT 2003 CSA
TI Motherhood and **malaria**
AU Miller, L.H.; Smith, J.D.
SO Nat. Med., (19981100) vol. 4, no. 11, pp. 1244-1245.
ISSN: 1078-8956.

L6 ANSWER 42 OF 42 SCISEARCH COPYRIGHT 2003 THOMSON ISI
TI **Malaria** during pregnancy: parasites, antibodies and **chondroitin** sulphate A
AU Duffy P E (Reprint); Fried M
SO BIOCHEMICAL SOCIETY TRANSACTIONS, (AUG 1999) Vol. 27, No. 4, pp. 478-482.
Publisher: PORTLAND PRESS, 59 PORTLAND PLACE, LONDON W1N 3AJ, ENGLAND.
ISSN: 0300-5127.

L6 ANSWER 17 OF 42 MEDLINE
AN 2000006305 MEDLINE
DN 20006305 PubMed ID: 10535993
TI **Plasmodium falciparum** domain mediating adhesion to **chondroitin** sulfate A: a receptor for human **placental** infection.
AU Buffet P A; Gamain B; Scheidig C; Baruch D; Smith J D; Hernandez-Rivas R; Pouvelle B; Oishi S; Fujii N; Fusai T; Parzy D; Miller L H; Gysin J; Scherf A
CS Unite de Biologie des Interactions Hote-Parasite, Centre National de la Recherche Scientifique/Unite de Recherche Associee 1960, Institut Pasteur, 75724 Paris, France.
SO PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1999 Oct 26) 96 (22) 12743-8.
Journal code: 7505876. ISSN: 0027-8424.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AJ133811
EM 199912
ED Entered STN: 20000113
Last Updated on STN: 20000113
Entered Medline: 19991210
AB **Malaria** during the first pregnancy causes a high rate of fetal and neonatal death. The decreasing susceptibility during subsequent pregnancies correlates with acquisition of antibodies that block binding of infected red cells to **chondroitin** sulfate A (**CSA**), a receptor for parasites in the **placenta**. Here we identify a domain within a particular **Plasmodium falciparum** erythrocyte membrane protein 1 that binds **CSA**. We cloned a **var gene** expressed in **CSA**-binding parasitized red blood cells (PRBCs). The gene had eight receptor-like domains, each of which was expressed on the surface of Chinese hamster ovary cells and was tested for **CSA** binding. **CSA** linked to biotin used as a probe demonstrated that two Duffy-binding-like (DBL) domains (DBL3 and DBL7) bound **CSA**. DBL7, but not DBL3, also bound **chondroitin** sulfate C (CSC) linked to biotin, a negatively charged sugar that does not support PRBC adhesion. Furthermore, **CSA**, but not CSC, blocked the interaction with DBL3; both **CSA** and CSC blocked binding to DBL7. Thus, only the DBL3 domain displays the same binding specificity as PRBCs. Because protective antibodies present after pregnancy block binding to **CSA** of parasites from different parts of the world, DBL-3, although variant, may induce cross-reactive immunity that will protect pregnant women and their fetuses.

L6 ANSWER 18 OF 42 MEDLINE
AN 1999238507 MEDLINE
DN 99238507 PubMed ID: 10220443
TI The adhesion of **Plasmodium falciparum**-infected erythrocytes to **chondroitin** sulfate A is mediated by P. **falciparum** erythrocyte membrane protein 1.
AU Reeder J C; Cowman A F; Davern K M; Beeson J G; Thompson J K; Rogerson S J; Brown G V
CS The Walter and Eliza Hall Institute of Medical Research, Post Office Royal Melbourne Hospital, Victoria 3050, Australia.. reeder@wehi.edu.au
SO PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1999 Apr 27) 96 (9) 5198-202.
Journal code: 7505876. ISSN: 0027-8424.
CY United States

DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF134154
EM 199906
ED Entered STN: 19990618
Last Updated on STN: 19990618
Entered Medline: 19990610
AB **Chondroitin** sulfate A (**CSA**) is an important receptor for the sequestration of **Plasmodium falciparum** in the **placenta**, but the parasite ligand involved in adhesion has not previously been identified. Here we report the identification of a **var gene** transcribed in association with **binding** to **CSA** and present evidence that the P. **falciparum** **erythrocyte** membrane **protein** 1 product of the **gene** is the parasite ligand mediating **CSA** **binding**. Description of this gene and the implication of P. **falciparum** erythrocyte membrane protein 1 as the parasite ligand paves the way to a more detailed understanding of the pathogenesis of **placental** infection and potential therapeutic strategies targeting the interaction.

L6 ANSWER 19 OF 42 MEDLINE
AN 1999007813 MEDLINE
DN 99007813 PubMed ID: 9791601
TI [**Plasmodium falciparum** and **chondroitin** -4-sulfate: the new key couple in sequestration].
Plasmodium falciparum et chondroitine-4-sulfate: le nouveau couple cle de la sequestration.
AU Pouvelle B; Fusai T; Gysin J
CS Laboratoire de Parasitologie Experimentale, Faculte de Medecine Aix-Marseille II, France.. ygypaly@imaginet.fr
SO MEDECINE TROPICALE, (1998) 58 (2) 187-98. Ref: 125
Journal code: 8710146. ISSN: 0025-682X.
CY France
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, ACADEMIC)
LA French
FS Priority Journals
EM 199812
ED Entered STN: 19990115
Last Updated on STN: 19990115
Entered Medline: 19981201
AB Some complications of **Plasmodium falciparum** infection such as cerebral **malaria** and pregnancy-associated **malaria** may be partially due to cytoadherence of erythrocytes infected by mature parasites on microvascular endothelial cells or **placental** syncytiotrophoblasts. Recently a new cytoadherence receptor, **chondroitin**-4-sulphate (**CSA**), was identified first on endothelial cells in primates and then on CHO cells and purified receptors. Further study has implicated **CSA** in cytoadherence of infected red blood cells to syncytiotrophoblasts in human **placenta** and Saimiri sciureus monkeys. In solution the minimal size for full inhibitory effect is approximately 9 kDa. Injection of **CSA** in **Plasmodium falciparum**-infected Saimiri monkeys resulted in specific release of sequestered erythrocytes infected by mature parasites. An added interest of these findings is that **CSA**, a glycosaminoglycan, is already in clinical use for treatment of degenerative joint disease. Current data on the parasite ligand for **CSA** indicates that it is not co-expressed with other cytoadherence

ligands and that its binding activity decreases as the parasite matures from the 20th to 40th hour of the cycle. Since one or more **var genes** encoding the **CSA** ligand have been identified, it is likely that peptides will be obtained quickly and used either for direct inhibition of cytoadherence on **CSA** or for development of an anti-sequestration vaccine.

L6 ANSWER 20 OF 42 MEDLINE
AN 1998298064 MEDLINE
DN 98298064 PubMed ID: 9632611
TI Inhibition of **binding** of **malaria**-infected **erythrocytes** by a tetradecasaccharide fraction from **chondroitin** sulfate A.
AU Beeson J G; Chai W; Rogerson S J; Lawson A M; Brown G V
CS Division of Infection and Immunity, The Walter and Eliza Hall Institute of Medical Research, Parkville, Victoria, Australia.
SO INFECTION AND IMMUNITY, (1998 Jul) 66 (7) 3397-402.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199807
ED Entered STN: 19980716
Last Updated on STN: 19980716
Entered Medline: 19980709
AB Adherence of parasite-infected erythrocytes (IEs) to the microvascular endothelium of various organs, a process known as sequestration, is a feature of **Plasmodium falciparum malaria**. This event is mediated by specific adhesive interactions between parasite proteins, expressed on the surface of IEs, and host molecules. P. **falciparum** IEs can bind to purified **chondroitin** sulfate A (CS-A), to the proteoglycan thrombomodulin through CS-A side chains, and to CS-A present on the surface of brain and lung endothelial cells and **placental** syncytiotrophoblasts. In order to identify structural characteristics of CS-A important for binding, oligosaccharide fragments ranging in size from 2 to 20 monosaccharide units were isolated from CS-A and CS-C, following controlled **chondroitin** lyase digestion, and used as competitive inhibitors of IE binding to immobilized ligands. Inhibition of binding to CS-A was highly dependent on molecular size: a CS-A tetradecasaccharide fraction was the minimum length able to almost completely inhibit binding. The effect was dose dependent and similar to that of the parent polysaccharide, and the same degree of inhibition was not found with the CS-C oligosaccharides. There was no effect on binding of IEs to other ligands, e.g., CD36 and intercellular adhesion molecule 1. Hexadeca- and octadecasaccharide fractions of CS-A were required for maximum inhibition of binding to thrombomodulin. Analyses of oligosaccharide fractions and polysaccharides by electrospray mass spectrometry and high-performance liquid chromatography suggest that the differences between the activities of CS-A and CS-C oligosaccharides can be attributed to differences in sulfate content and sulfation pattern and that iduronic acid is not involved in IE binding.

L6 ANSWER 21 OF 42 MEDLINE
AN 97293263 MEDLINE
DN 97293263 PubMed ID: 9149236
TI **Plasmodium falciparum**-infected erythrocytes adhere to the proteoglycan thrombomodulin in static and flow-based systems.
AU Rogerson S J; Novakovic S; Cooke B M; Brown G V
CS Walter and Eliza Hall Institute of Medical Research, Royal Melbourne Hospital, Victoria, Australia.

NC DK 32094-10 (NIDDK)
SO EXPERIMENTAL PARASITOLOGY, (1997 May) 86 (1) 8-18.
Journal code: 0370713. ISSN: 0014-4894.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199705
ED Entered STN: 19970602
Last Updated on STN: 19980206
Entered Medline: 19970522
AB **Plasmodium falciparum**-infected erythrocytes can bind to the glycosaminoglycan **chondroitin** sulfate A. In this paper, we demonstrate that thrombomodulin, a proteoglycan present on endothelial cells and **placental** syncytiotrophoblasts, supports **binding** of selected lines of P. **falciparum**-infected **erythrocytes** in both static and flow-based assays, and that adhesion is dependent on the presence of the **chondroitin** sulfate A chain of thrombomodulin. Chondroitinase treatment of thrombomodulin abolished binding, and free **chondroitin** sulfate A prevented it, whereas other soluble glycosaminoglycans had little or no effect. Soluble thrombomodulin (with, but not without, its **chondroitin** sulfate chain) inhibited binding at 40 micrograms/ml, but not at physiological concentrations. Parasitized **erythrocytes** bound to cells expressing thrombomodulin, including human umbilical vein endothelial cells and A549 cells, and **binding** was inhibited by free **chondroitin** sulfate A. Established binding to A549 cells or to immobilized thrombomodulin was substantially reversed by **chondroitin** sulfate A at 10 micrograms/ml. The **chondroitin** sulfate chain of thrombomodulin is a receptor for **malaria**-infected erythrocytes in static assays and under physiological flow.

L6 ANSWER 23 OF 42 CAPLUS COPYRIGHT 2003 ACS
AN 2001:283442 CAPLUS
DN 135:255364
TI Variants of **Plasmodium falciparum** erythrocyte membrane protein 1 expressed by different **placental** parasites are closely related and adhere to **chondroitin** sulfate A
AU Khattab, Ayman; Kun, Jurgen; Deloron, Philippe; Kremsner, Peter G.; Klinkert, Mo-Quen
CS Department of Parasitology, University of Tubingen, Tubingen, 72074, Germany
SO Journal of Infectious Diseases (2001), 183(7), 1165-1169
CODEN: JIDIAQ; ISSN: 0022-1899
PB University of Chicago Press
DT Journal
LA English
AB **Plasmodium falciparum**-infected erythrocytes adhere to syncytiotrophoblast cells lining the **placenta** via glycosaminoglycans, such as **chondroitin** sulfate A (**CSA**) and hyaluronic acid. Adherence of infected erythrocytes to host receptors is mediated by P. **falciparum** erythrocyte membrane protein-1 (PfEMP-1). A single PfEMP-1 domain (duffy binding-like [DBL]-3, of the .gamma. sequence class) from lab.-adapted strains is thought to be responsible for binding to **CSA**. In this study, DBL-.gamma. domains expressed by **placental** P. **falciparum** isolates were shown to have an affinity to **CSA**. All parasite populations accumulating in infected **placentas** express only 1 variant of PfEMP-1, each of which contains a DBL-.gamma. domain with **CSA** binding capacities. Furthermore, sequence anal. data provide evidence for

antigenic conservation among the DBL-.gamma. sequences expressed by different **placental** parasites. This study offers a close reflection of the process of parasite adhesion in the **placenta** and is crucial to the understanding of the pathogenesis of **malaria** during pregnancy.

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 24 OF 42 CAPLUS COPYRIGHT 2003 ACS
AN 2001:168150 CAPLUS
DN 134:218025
TI **Plasmodium falciparum** gene FCR3.varCSA EMP1 (**erythrocyte** membrane protein 1) protein, its sequence, functional domains, recombinant production, **binding** to **chondroitin** sulfate A, therapeutic and diagnostic uses
IN Scherf, Arthur; Miller, Louis H.; Gamain, Benoit; Baruch, Dror I.; Buffet, Pierre; Scheidig, Christine; Gysin, Jurg; Pouvelle, Bruno; Fujii, Nbbutaka; Smith, Joseph
PA Government of the United States of America, as Represented by the Secretary, Department of Health and Human Services, USA
SO PCT Int. Appl., 78 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001016326	A2	20010308	WO 2000-US24195	20000901
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EE, EE, ES, FI, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	AU 2000073455	A5	20010326	AU 2000-73455	20000901
	EP 1212423	A2	20020612	EP 2000-961513	20000901
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
PRAI	US 1999-152023P	P	19990901		
	WO 2000-US24195	W	20000901		

AB The invention provides a cDNA mol. encoding **Plasmodium falciparum** gene FCR3.varCSA protein, a large **erythrocyte** surface mol. (referred to as EMP1) that binds to **chondroitin** sulfate A (**CSA**), and modulates parasitized (**Plasmodium** infected) red blood cell **binding** (PRBC) **binding** to **CSA**. The invention also provides cDNA mols. encoding the Duffy binding like 3 (DBL3) and cysteine-rich interdomain region 1 (CIDR1) domains of P. **falciparum** protein EMP1, two domains which were shown to be involved in PRBC binding, sequestration and onset of **maternal malaria**. The invention further provides: (1) expression vectors contg. said cDNA mols.; (2) use of said expression vectors for transforming host cells for the recombinant prodn. of the protein EMP1; (3) nucleic acid mols. (such as primers and/or probes) that hybridize to said cDNA mols.; and (4) anti-EMP1 protein antibodies. Still further, the invention provides: (1) methods for identifying agents that modulate protein EMP1 binding to **CSA**; (2) pharmaceuticals comprising said anti-EMP1 antibodies or said agent that modulates EMP1;

(3) use of antisense FCR3.varCSA nucleic acids, EMP1 proteins and/or other varCSA proteins (such as A4 tres DBL3-.gamma. or ItG2-CS2 DBL2-.gamma.) in treatment and/or prevention of **maternal malaria**, and
(4) a method for making a FCR3.varCSA disease-state profile. Finally, the invention provides the cDNA and amino acid sequences of P. **falciparum** gene FCR3.varCSA EMP1 protein, as well as the amino acid sequences of varCSA proteins A4 tres DBL3-.gamma. and ItG2-CS2 DBL2-.gamma..

L6 ANSWER 26 OF 42 CAPLUS COPYRIGHT 2003 ACS
AN 1997:154227 CAPLUS
DN 126:198080
TI **Chondroitin** sulfate A as an adherence receptor for **Plasmodium falciparum**-infected erythrocytes
AU Rogerson, S.J.; Brown, G.V.
CS Immunoparasitology Unit, The Walter and Eliza Hall Institute of Medical Research, Post Office Royal Melbourne Hospital, Victoria, 3050, Australia
SO Parasitology Today (1997), 13(2), 70-75
CODEN: PATOE2; ISSN: 0169-4758
PB Elsevier
DT Journal; General Review
LA English
AB A review, with 50 refs. Until recently, the sequestration of erythrocytes infected with **Plasmodium falciparum** has been thought to be due to one of a no. of protein-protein interactions. In this article, Stephen Rogerson and Graham Brown summarize the emerging evidence that, in vitro, infected erythrocytes can also adhere to the glycosaminoglycan **chondroitin** sulfate A (**CSA**) expressed on the surface of cells and immobilized on plastic. In vivo, **binding** of infected **erythrocytes** to **CSA** could be crucial to the development of malarial infection of the **placenta**, and possibly to sequestration in the lung and brain. The consequences of this may include **maternal** morbidity and mortality, low birth wt. in the infant, pulmonary edema and cerebral **malaria**. They discuss the need to characterize the mol. basis of this interaction, and to investigate the possible therapeutic role of **CSA** in **malaria**. **Chondroitin** sulfates are nontoxic compds. already in use for other diseases in humans. Vaccines based on inhibiting this receptor-ligand interaction could also be appropriate.

L6 ANSWER 33 OF 42 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1999:392360 BIOSIS
DN PREV199900392360
TI **Plasmodium falciparum** isolates from infected pregnant women and children are associated with distinct adhesive and antigenic properties.
AU Beeson, James G. (1); Brown, Graham V.; Molyneux, Malcolm E.; Mhango, Chisale; Dzinjalamala, Fraction; Rogerson, Stephen J.
CS (1) Walter and Eliza Hall Institute of Medical Research, Royal Melbourne Hospital, Parkville, VIC, 3050 Australia
SO Journal of Infectious Diseases, (Aug., 1999) Vol. 180, No. 2, pp. 464-472.
ISSN: 0022-1899.
DT Article
LA English
SL English
AB **Plasmodium falciparum malaria** during pregnancy is an important cause of **maternal** and infant morbidity and mortality. Accumulation of large numbers of P. **falciparum** -infected **erythrocytes** in the **maternal** blood spaces of the **placenta** may be mediated by adhesion of infected

erythrocytes to molecules presented on the syncytiotrophoblast surface. In this study, isolates from **placentas** and peripheral blood of infected pregnant women and from children were tested for **binding** to purified receptors and for agglutination with adult sera. Results suggest that adhesion to **chondroitin** sulfate A may be involved in **placental** parasite sequestration in most cases, but other factors are also likely to be important. Agglutination assay results suggest that parasites infecting pregnant women are antigenically distinct from those common in childhood disease. The prevalence of agglutinating antibodies to pregnancy isolates was generally low, but it was highest in multigravidae who are likely to have hadthe greatest exposure.

L6 ANSWER 34 OF 42 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1999:282853 BIOSIS
DN PREV199900282853
TI **Plasmodium falciparum**-infected erythrocytes: A mutational analysis of cytoadherence via murine thrombomodulin.
AU Rabhi-Sabile, Samia; Steiner-Mosonyi, Marta; Pollefeyt, Saskia; Collen, Desire; Pouvelle, B.; Gysin, Jurg; Boffa, Marie-Claire; Conway, Edward M. (1)
CS (1) University of Leuven, Herestraat 49, Campus Gasthuisberg O and N, 9th Floor, B-3000, Leuven Belgium
SO Thrombosis and Haemostasis, (May, 1999) Vol. 81, No. 5, pp. 815-821. ISSN: 0340-6245.
DT Article
LA English
SL English
AB The pathophysiologic events leading to organ damage in **Plasmodium falciparum malaria** infections involve adhesion and sequestration of parasite-infected **erythrocytes** (PRBC) to the vascular endothelium and syncytiotrophoblast. Several potential receptors to which the PRBCs may bind have recently been identified, one of which is thrombomodulin (TM). TM has been implicated particularly in mediating sequestration of P. **falciparum**-infected **erythrocytes** in the **placenta** and brain, two sites of disease associated with high morbidity. In order to establish that **binding** of parasite-infected red blood cells to TM is dependent on its containing **chondroitin**-4-sulfate (**CSA**), we have mutated the **CSA**-attachment site of murine TM, and expressed this mutant form (TMser-gly) in COS-7 cells. In cytoadhesion assays, we demonstrate that, in contrast to wild-type TM which contains **CSA** and supports the adhesion of 1466 PRBCs/mm2, TMser-gly does not contain **CSA** and adhesion of PRBCs to thosecells expressing TMser-gly is entirely abrogated (200 PRBCs/mm2). These studies further confirm that the **CSA** of TM may play a role in the pathophysiology of **malaria** by providing a **binding** site for PRBCs.

L6 ANSWER 35 OF 42 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1997:208099 BIOSIS
DN PREV199799507302
TI Cytoadherence of **Plasmodium falciparum** to intercellular adhesion molecule 1 and **chondroitin**-4-sulfate expressed by the syncytiotrophoblast in the human **placenta**.
AU Maubert, Ebertrand; Guilbert, Larry J.; Deloron, Philippe (1)
CS (1) INSERM U13/IMEA, CHU Bichat, 46 rue Henri Huchard, 75018 Paris France
SO Infection and Immunity, (1997) Vol. 65, No. 4, pp. 1251-1257. ISSN: 0019-9567.
DT Article
LA English
AB Late stages of **Plasmodium falciparum**-infected

erythrocytes (IRBCs) frequently sequester in the **placentas** of pregnant women, a phenomenon associated with low birth weight of the offspring. To investigate the physiological mechanism of this sequestration, we developed an in vitro assay for studying the cytoadherence of IRBCs to cultured term human trophoblasts. The capacity for **binding** to the syncytiotrophoblast varied greatly among P. **falciparum** isolates and was mediated by intercellular adhesion molecule 1 (ICAM-1), as **binding** was totally inhibited by 84H10, a monoclonal antibody specific for ICAM-1. **Binding** of the P. **falciparum** line RP5 to the syncytiotrophoblast involves **chondroitin**-4-sulfate (**CSA**), as this **binding** was dramatically impaired by addition of free **CSA** to the **binding** medium or by preincubation of the syncytiotrophoblast with chondroitinase ABC. ICAM-1 and **CSA** were visualized on the syncytiotrophoblast by immunofluorescence, while CD36, E-selectin, and vascular cell adhesion molecule 1 were not expressed even on tumor necrosis factor alpha (TNF-alpha)-stimulated syncytiotrophoblast tissue, and monoclonal antibodies against these cell adhesion molecules did not inhibit cytoadherence. ICAM-1 expression and cytoadherence of wild isolates was upregulated by TNF-alpha, a cytokine that can be secreted by the numerous mononuclear phagocytes present in **malaria**-infected **placentas**. These results suggest that cytoadherence may be involved in the **placental** sequestration and broaden the understanding of the physiopathology of the **malaria**-infected **placenta**.

L6 ANSWER 36 OF 42 LIFESCI COPYRIGHT 2003 CSA
AN 1999:16433 LIFESCI
TI Motherhood and **malaria**
AU Miller, L.H.; Smith, J.D.
CS Laboratory of Parasitic Diseases, NIAID, NIH, Bethesda, MD 20892-0425, USA
SO Nat. Med., (19981100) vol. 4, no. 11, pp. 1244-1245.
ISSN: 1078-8956.
DT Journal
FS F; K
LA English
SL English
AB Multigravid women, who are protected from **malaria** during pregnancy, possess antibodies that block the **binding** of infected **erythrocytes** to **chondroitin** sulfate A, a **placental** receptor.

L6 ANSWER 42 OF 42 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AN 1999:672971 SCISEARCH
GA The Genuine Article (R) Number: 230RF
TI **Malaria** during pregnancy: parasites, antibodies and **chondroitin** sulphate A
AU Duffy P E (Reprint); Fried M
CS WALTER REED ARMY MED CTR, WALTER REED ARMY INST RES, DEPT IMMUNOL, WASHINGTON, DC 20307 (Reprint)
CYA USA
SO BIOCHEMICAL SOCIETY TRANSACTIONS, (AUG 1999) Vol. 27, No. 4, pp. 478-482.
Publisher: PORTLAND PRESS, 59 PORTLAND PLACE, LONDON W1N 3AJ, ENGLAND.
ISSN: 0300-5127.
DT Article; Journal
FS LIFE
LA English
REC Reference Count: 50

L8 ANSWER 12 OF 26 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI The **chondroitin** sulfate of murine thrombomodulin mediates **binding** of **Plasmodium falciparum**-infected **erythrocytes**: A mutational analysis.
AU Rabhi-Sabile, S.; Steiner-Mosonyi, M.; Pollefeyt, S.; Gysin, J.; Collen, D.; Boffa, M.-C.; Conway, E. M.
SO Blood, (Nov. 15, 1998) Vol. 92, No. 10 SUPPL. 1 PART 1-2, pp. 704A. Meeting Info.: 40th Annual Meeting of the American Society of Hematology Miami Beach, Florida, USA December 4-8, 1998 The American Society of Heamatology
. ISSN: 0006-4971.

L8 ANSWER 15 OF 26 LIFESCI COPYRIGHT 2003 CSA
TI **Plasmodium falciparum**: Involvement of additional receptors in the cytoadherence of infected erythrocytes to microvascular endothelial cells
AU Xiao, L.; Yang, C.; Dorovini-Zis, K.; Tandon, N.N.; Ades, E.W.; Lal, A.A.; Udhayakumar, V.*
SO EXP. PARASITOL., (19961000) vol. 84, no. 1, pp. 42-55.
ISSN: 0014-4894.

L8 ANSWER 18 OF 26 SCISEARCH COPYRIGHT 2003 THOMSON ISI
TI CD36 peptides that block cytoadherence define the CD36 **binding** region for **Plasmodium falciparum**-infected **erythrocytes**
AU Baruch D I (Reprint); Ma X C; Pasloske B; Howard R J; Miller L H
SO BLOOD, (15 SEP 1999) Vol. 94, No. 6, pp. 2121-2127.
Publisher: W B SAUNDERS CO, INDEPENDENCE SQUARE WEST CURTIS CENTER, STE 300, PHILADELPHIA, PA 19106-3399.
ISSN: 0006-4971.

L8 ANSWER 12 OF 26 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1999:122548 BIOSIS
DN PREV199900122548
TI The **chondroitin** sulfate of murine thrombomodulin mediates **binding** of **Plasmodium falciparum**-infected **erythrocytes**: A mutational analysis.
AU Rabhi-Sabile, S.; Steiner-Mosonyi, M.; Pollefeyt, S.; Gysin, J.; Collen, D.; Boffa, M.-C.; Conway, E. M.
CS Univ. Toronto, Toronto, ON Canada
SO Blood, (Nov. 15, 1998) Vol. 92, No. 10 SUPPL. 1 PART 1-2, pp. 704A. Meeting Info.: 40th Annual Meeting of the American Society of Hematology Miami Beach, Florida, USA December 4-8, 1998 The American Society of Heamatology
. ISSN: 0006-4971.
DT Conference
LA English

L8 ANSWER 15 OF 26 LIFESCI COPYRIGHT 2003 CSA
AN 1998:82511 LIFESCI
TI **Plasmodium falciparum**: Involvement of additional receptors in the cytoadherence of infected erythrocytes to microvascular endothelial cells
AU Xiao, L.; Yang, C.; Dorovini-Zis, K.; Tandon, N.N.; Ades, E.W.; Lal, A.A.; Udhayakumar, V.*
CS Division of Parasitic Diseases, and Biological Products Branch, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Public Health Service, U.S. Department of Health and Human Services, Atlanta, Georgia 30341, USA
SO EXP. PARASITOL., (19961000) vol. 84, no. 1, pp. 42-55.
ISSN: 0014-4894.
DT Journal
FS K
LA English
SL English
AB **Plasmodium falciparum**: Involvement of additional receptors in the cytoadherence of infected **erythrocytes** to microvascular endothelial cells. Experimental Parasitology 84, 42-55. The involvement of additional ligands in the cytoadhesion of PRBC to endothelial cells was studied by the use of human microvascular endothelial cells (HMEC-1), brain microvascular endothelial cells (HBEC-5I), umbilical vein endothelial cells (HUVEC), and C32 melanoma cells as well as soluble CD36, ICAM-1, and thrombospondin in the adhesion assays. Immunostaining showed that ICAM-1 and thrombospondin were expressed by all cell lines, whereas CD36 and VCAM-1 were expressed constitutively only by C32 melanoma cells and HBEC-5I, respectively; none of these cells had basal expression of E-selectin. **Bindings** of the parental HB3 parasite strain to HMEC-1 and HUVEC were higher than that to HBEC-5I and C32 melanoma cells. Selections by panning the parental HB3 through HMEC-1 (HB3EC-6 line) or C32 melanoma cells (HB3C32-6 line) six times increased **bindings** by more than 10-fold, but the **binding** of HB3C32-6 to HMEC-1 was higher than that to C32 melanoma cells. Antibody or peptide blockade against CD36, ICAM-1, and thrombospondin or preincubation of target cells with TNF- alpha and IFN-gamma did not significantly alter the **binding** intensity of HB3EC-6 to HMEC-1 and HB3C32-6 to C32 melanoma cells. Preincubation of HMEC-1 with IL-4, however, reduced its **binding** with HB3EC-6. In vitro selection did not enhance the **binding** of PRBC to platebound CD36 or thrombospondin; **binding** to ICAM-1 was negligible. The **binding** of both selected lines was inhibited by dextran sulfate and sulfatides, but not by **chondroitin** sulfate

A. These results suggested that in addition to CD36 and thrombospondin, sulfated glycoconjugates were probably concurrently utilized by these PRBC as receptors. Experiments with freshly isolated Kenyan parasites indicated that they also exhibited a similar mechanism of **binding** to endothelial cells.

L8 ANSWER 18 OF 26 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AN 1999:704881 SCISEARCH
GA The Genuine Article (R) Number: 234KU
TI CD36 peptides that block cytoadherence define the CD36 **binding** region for **Plasmodium falciparum**-infected **erythrocytes**
AU Baruch D I (Reprint); Ma X C; Pasloske B; Howard R J; Miller L H
CS NIAID, PARASIT DIS LAB, NIH, NIH BLDG 4, ROOM B1-37, 4 CTR DR, MSC 0425, BETHESDA, MD 20892 (Reprint); AFFYMAX RES INST, SANTA CLARA, CA
CYA USA
SO BLOOD, (15 SEP 1999) Vol. 94, No. 6, pp. 2121-2127.
Publisher: W B SAUNDERS CO, INDEPENDENCE SQUARE WEST CURTIS CENTER, STE 300, PHILADELPHIA, PA 19106-3399.
ISSN: 0006-4971.
DT Article; Journal
FS LIFE; CLIN
LA English
REC Reference Count: 47
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB Mature **Plasmodium falciparum** parasitized **erythrocytes** (PE) sequester from the circulation by adhering to microvascular endothelial cells. PE sequestration contributes directly to the virulence and severe pathology of **falciparum malaria**. The scavenger receptor, CD36, is a major host receptor for PE adherence. PE adhesion to CD36 is mediated by the malarial variant antigen, P. **falciparum erythrocyte** membrane protein 1 (PfEMP1), and particularly by its cysteine-rich interdomain region 1 (CIDR-1). Several peptides from the extended immunodominant domain of CD36 (residues 139-184), including CD36 139-155, CD36 145-171, CD36 146-164, and CD36 156-184 interfered with the CD36-PfEMP1 interaction. Each of these peptides affected **binding** at the low micromolar range in 2 independent assays. Two peptides, CD36 145-171 and CD36 156-184, specifically blocked PE adhesion to CD36 without affecting **binding** to the host receptor intercellular adhesion molecule-1 (ICAM-1). Moreover, an adhesion blocking peptide from the ICAM-1 sequence inhibits the PfEMP1-ICAM-1 interaction without affecting adhesion to CD36, These results confirm earlier observations that PfEMP1 is also a receptor for ICAM-1, Thus, the region 139-184 and particularly the 146-164 or the 145-171 regions of CD36 form the adhesion region for P. **falciparum** PE, Adherence blocking peptides from this region may be useful for modeling the PE/PfEMP1 interaction with CD36 and for development of potential anti-adhesion therapeutics. (C) 1999 by The American Society of Hematology.